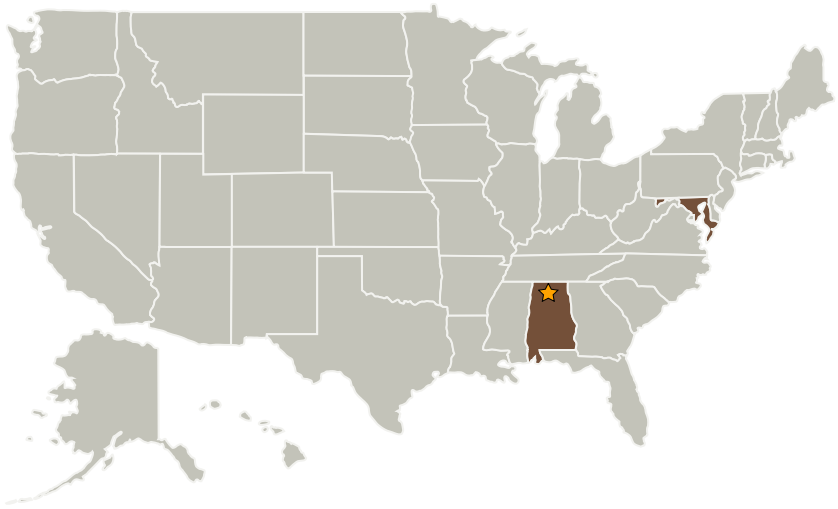
Magnesium MMC for Aerospace Structures, Phase I

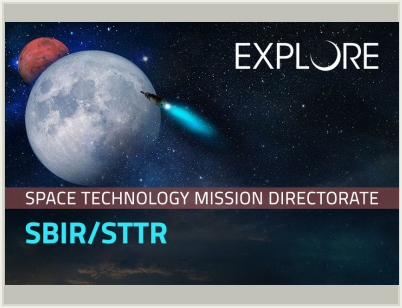
Completed Technology Project (2007 - 2007)

Project Introduction

NASA will return to the IIS by 2014 and the moon by 2020. To accomplish these missions, NASA will exploit to the maximum degree possible the Apollo architecture and especially the lessons learned and technological advances that have occurred over the intervening 40 years in building robust, cost effective, efficient, and, partly reusable launch, lander, explorer, and resupply vehicles. In support of this effort, Technology Assessment & Transfer (TA&T) proposes to develop a magnesium metal matrix composite (MMC) for use as aerospace structural members. This material exhibits three times the specific stiffness of the best aluminum-lithium alloys and two times that of PMCs. TA&T will demonstrate the feasibility and practicality of a low temperature method for achieving high loading of ceramic particles in a magnesium matrix that will enable a cast or extruded structural material of non-uniform cross-section exhibiting the unusual combination of light weight, high specific stiffness and strength, radiation shielding, and low cost. The MMC will be protected from corrosion by a unique thin film coating designed specifically to prevent corrosion of aluminum and magnesium alloys.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Technology Assessment & Transfer, Inc.	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Annapolis, Maryland

Primary U.S. Work Locations	
Alabama	Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.1 Lightweight Structural Materials